

**REMARKS**

***Disposition of Claims:***

Claims 1-22, 24, 25, 27-31, 33, 34 and 37-40 are all the claims pending in the application. Claims 1-22, 24, 25, 27-31, 33, 34, 39 and 40 are rejected and claims 37 and 38 are withdrawn from consideration.

***Claim Rejections Under 35 U.S.C. § 112:***

Claims 1-40 are rejected under 35 U.S.C. § 112 (second paragraph) as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 1 has been amended to recite “wherein said region (16) of said die (12) in which thermal energy is generated remains for less than 25 seconds at a temperature greater than or equal to the glass transition temperature of the polymeric material” which was inadvertently omitted in a previous amendment. Claim 39 has been amended as well. Thus, it is respectfully requested that this rejection be withdrawn.

***Claim Rejections Under 35 U.S.C. § 103:***

Claims 1-22, 24-25, 27-30, 33-34 and 39-40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou (U.S. Patent No. 5,772,905) in view of Kim (U.S. Patent No. 5,064,597). Further, claim 31 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou in view of Kim, as applied to claim 1 above, further in view of Zapka, et al. (U.S. Patent No. 4,855,197). For the following reasons, Applicants respectfully traverse these rejections.

In addition to the amendment discussed above, claim 1 has been amended, so as it is irrefutable that:

- (A) it refers solely to a micro-or nano-impression process, and

- (B) the heat is generated only in one specified region of the die, namely a surface layer.

Feature (A) is supported by the first paragraph of page 1 of the description referring to the general technical field of the present application, as well as by the description of the embodiments, wherein it is emphasized that we are referring to a "nano-impression lithographic process" (see e.g. page 6, 2nd paragraph, page 12, last paragraph and page 13, first full paragraph).

Feature (B) is supported e.g. by the last paragraph of page 10, disclosing that only the layer 16 of the die 12 is of material capable of heating upon exposure to electromagnetic radiation, whereas the other portion 24 of the layer is transparent to such radiation and thus does not generate any heat. Feature (B) is also supported by the first paragraph of page 10 — referring to a different embodiment of the invention — wherein it is clearly indicated that only the surface layer 16 is electrically conductive (and thus susceptible of generating heat due to the Joule effect), whereas the underlying layer 24 is substantially not interested by the flow of an electric current.

Upon entry of these amendment, it is respectfully submitted that the response of the Examiner to the previously filed arguments is not persuasive. In particular — contrary to what is asserted in the second item of ¶ 7 of the outstanding Office Action (last paragraph of page 9) — it cannot anymore be denied that the main reference Chou (indicating that the entire mold has to be heated) teaches away from the present invention in which the surface layer is heated, so as to render moot the obviousness rejection.

On the other hand, it is respectfully submitted that the Examiner may not fully understand that the gist of the present invention resides in that the surface layer of the die wherein heat is

generated and (which remains for less than 25 seconds at a temperature greater than or equal to the glass transition temperature ( $T_g$ ) of the polymeric material) is comparatively small with regard to the entire die and is kept at high temperature for a short span of time, so that the general advantages due to the generation of thermal energy upon dissipation of another form of energy in terms of absence of meaningful phenomena of thermal expansion/contraction, short transition process times and energy savings are further emphasized.

In this respect, it has to be noticed that - due to the peculiar structure (very low thickness) of micro- and nano-materials - it is straightforward that they assume in a very short time the temperature of other articles (in particular the heating surface layer of the mold) with which they come into contact. Hence, it is sufficient that such surface layer is at a temperature  $T_g$  in order that the polymeric material is at a corresponding temperature,

Such behavior of the micro- and nano-materials greatly differs from that of the ordinary materials and explains why — contrary to the allegations at the third item of ¶ 7 of the outstanding Office Action (first paragraph of page 10) — it would not at all be obvious to apply to the processes of the present invention - which concern micro- and nano-materials - teachings derived from other technical sectors, such as the ones of Kim.

In any case, Kim clearly teaches (see col. 3, line 26 to col. 4, line 35) that the mold layer 13 wherein heat is generated is covered by other insulating layers 15, 17, so it is not a surface layer, contrary to what is presently claimed. Hence, it has to be excluded that any obviousness rejection of the present claims may be based on Kim.

***Conclusion:***

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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Date: January 11, 2010